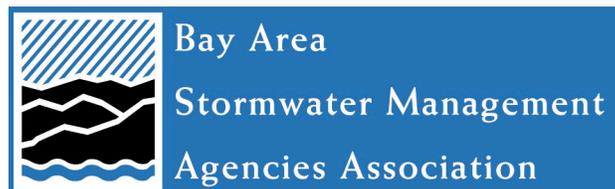


Annual Reporting for FY 2016-2017

Regional Supplement for Training and Outreach

San Francisco Bay Area Municipal Regional Stormwater Permit

B A S M A A



September 2017



B A S M A A

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

Napa County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Water Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Sonoma County
Water Agency

Vallejo Sanitation
and Flood
Control District

Bay Area

Stormwater Management

Agencies Association

P.O. Box 2385

Menlo Park, CA 94026

510.622.2326

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To Whom It May Concern:

We certify under penalty of law that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James Scanlin, Alameda Countywide Clean Water Program

Adele Ho, Contra Costa Clean Water Program

Kevin Cullen, Fairfield-Suisun Urban Runoff Management Program

Matthew Fabry, San Mateo Countywide Water Pollution Prevention Program

Adam Olivieri, Santa Clara Valley Urban Runoff Pollution Prevention Program

Jennifer Harrington, Vallejo Sanitation and Flood Control District

**MRP Regional Supplement for Training and Outreach
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INTRODUCTION

This Regional Supplement has been prepared to report on regionally implemented activities complying with portions of the Municipal Regional Stormwater Permit (MRP), issued to 76 municipalities and special districts (Permittees) by the San Francisco Bay Regional Water Quality Control Board (Water Board). The Regional Supplement covers training and outreach activities related to the following MRP provisions:

- Provision C.5.e., Control of Mobile Sources,
- Provision C.7.c.ii.(1), Stormwater Point of Contact,
- Provision C.9.e.ii.(1), Point of Purchase Outreach, and
- Provision C.9.e.ii.(3), Outreach to Pest Control Professionals

These regionally implemented activities are conducted under the auspices of the Bay Area Stormwater Management Agencies Association (BASMAA), a 501(c)(3) non-profit organization comprised of the municipal stormwater programs in the San Francisco Bay Area. Most of the 2016-2017 annual reporting requirements of the specific MRP Provisions covered in this Supplement are completely met by BASMAA Regional Project activities, except where otherwise noted herein or by Permittees in their reports. Scopes, budgets, and contracting or in-kind project implementation mechanisms for BASMAA Regional Projects follow BASMAA's operational Policies and Procedures as approved by the BASMAA Board of Directors. MRP Permittees, through their program representatives on the Board of Directors and its committees, collaboratively authorize and participate in BASMAA Regional Projects or Regional Tasks. Depending on the Regional Project or Task, either all BASMAA members or Phase I programs that are subject to the MRP share regional costs.

Training

C.5.e. Control of Mobile Sources

This provision requires:

Each Permittee shall implement a program to reduce the discharge of pollutants from mobile businesses.

(1) The program shall include the following:

- (a) Implementation of minimum standards and BMPs for each of the various types of mobile businesses, such as automobile washing, power washing, steam cleaning, and carpet cleaning.*
 - (b) Implementation of an enforcement strategy that specifically addresses the unique characteristics of mobile businesses.*
 - (c) Regularly updating mobile business inventories.*
 - (d) Implementation of an outreach and education strategy to mobile businesses operating within the Permittee's jurisdiction.*
 - (e) Inspection of mobile businesses, as needed.*
- (2) Permittees may cooperate county-wide and/or region-wide with the implementation of their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.*

MRP Regional Supplement for Training and Outreach Annual Reporting for FY 2016-2017

BASMAA's long-standing Surface Cleaner Training and Recognition Program addresses these aspects of the provision by focusing on the most common type of outdoor cleaning – cleaning of flat surfaces like sidewalks, plazas, parking areas, and buildings. Individual Permittees address the inspection and enforcement aspects of the provision.

Previously, BASMAA, the Regional Water Board, and mobile businesses jointly developed best management practices. The BMPs were packaged and delivered in training materials (e.g., *Pollution from Surface Cleaning* folder), and via workshops and training videos. The folder and the training video have since been translated into Spanish. Cleaners that take the training and a self-quiz are designated by BASMAA as Recognized Surface Cleaners. BASMAA also created and provides marketing materials for use by Recognized Surface Cleaners. Previously, BASMAA converted the delivery mechanism to being online so that mobile businesses would have on-demand access to the materials and the training. BASMAA continues to maintain the [Surface Cleaner Training and Recognition](#) program. Cleaners can use the website to get trained and recognized for the first time or renew their training and recognition, as required annually. Recognized cleaners can also download marketing materials from the website. Potential customers, including Permittees can use the site to verify the recognition status of any cleaner, as can municipal inspectors.

In July 2014, the State Water Board adopted a temporary Emergency Regulation for Statewide Urban Water Conservation that directly affected some of the surface cleaning activities and best management practices of the Surface Cleaner Training and Recognition Program. Among other actions, the emergency regulations "prohibited, except where necessary to address an immediate health and safety need:...

- 2) The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;
- 3) The application of potable water to driveways and sidewalks;"

The regulation was to remain in effect for 270 days, unless extended by the State Water Board due to ongoing drought conditions.

Of particular concern was item 3), which prohibited many of the activities conducted by surface cleaners if an immediate health and safety need could not be demonstrated and would require significant changes in the Surface Cleaner Training and Recognition Program. However, both the term and content of the emergency regulations were temporary and the State Water Board might need to change either with minimal notice. Given the uncertain long-term future of the emergency regulations, BASMAA adopted a two-part strategy:

- 1) track the status of the emergency regulations with a plan to make the necessary changes to the Surface Cleaner Training and Recognition Program if the regulations became permanent, and
- 2) alert the cleaners that are in the Surface Cleaner Training and Recognition Program to the emergency regulations.

To effect part 2), in August 2014, BASMAA sent a notice to all the Recognized Cleaners

MRP Regional Supplement for Training and Outreach Annual Reporting for FY 2016-2017

alerting them to the emergency regulations (see attachment). Regarding part 1), in May 2015, the State Water Board amended and readopted the emergency regulation extending its effectiveness to February 2016. In February 2016, the State Water Board extended the emergency regulation through October 2016 (into FY 16-17). In May 2016, the State Water Board replaced the emergency regulation adopted in February 2016 and extended the regulation through February 2017. In February 2017, the State Water Board extended the emergency regulation for 270 days (approximately November 2017) unless the State Water Board determines that it is no longer necessary due to changed conditions. In discussions with BASMAA in late March 2017, State Water Board staff indicated that they plan to propose the regulations be made permanent in November 2017, that the regulations would regulate water use and not the discharge, and the regulations would regulate the use of potable water. BASMAA continues to track any developments and will work with the State Water Board as they develop and adopt a permanent regulation to try to ensure that necessary outdoor surface cleaning activities can be conducted in accordance with both stormwater regulations and urban water conservation regulations.

Public Information and Outreach

C.7.c.ii.(1) Stormwater Point of Contact

This provision requires:

Each Permittee shall maintain and publicize one point of contact for information on stormwater issues, watershed characteristics, and stormwater pollution prevention alternatives. This point of contact can be maintained individually or collectively and Permittees may combine this function with the spill and dumping complaint central contact point required in C.5.

BASMAA assists with this provision by using the regional website: BayWise.org to list or link to member programs' lists of points of contact and contact information for the stormwater agencies in the Bay Area (<http://baywise.org/about-us>).

Pesticides Toxicity Control

C.9.e.ii.(1) Point of Purchase Outreach

This provision requires Permittees to:

- *Conduct outreach to consumers at the point of purchase;*
- *Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control; and*
- *Participate in and provide resources for the "Our Water, Our World" program or a functionally equivalent pesticide use reduction outreach program.*

The Annual Reporting provision requires:

Outreach conducted at the county or regional level shall be described in Annual Reports prepared at that respective level; reiteration in individual Permittee reports is discouraged. Reports shall include a brief description of outreach conducted...,

MRP Regional Supplement for Training and Outreach Annual Reporting for FY 2016-2017

including level of effort, messages and target audience. (The effectiveness of outreach efforts shall be evaluated only once in the Permit term, as required in Provision C.9.f. [Ed. C.9.g]).

Below is a report of activities and accomplishments of the *Our Water, Our World* program for FY 2016-2017.

- Continued the makeover of the look and content of the *Our Water, Our World* materials from the previous fiscal year with relatively minor content changes to the *Pest or Pal Activity Guide for Kids* and an alternative shelf tag that uses the word “effective” rather than “less-toxic” for use on select products, particularly fertilizers (see attachment).
- Coordinated program implementation with major chains Home Depot, Orchard Supply Hardware (OSH), and Ace Hardware National. Corporate office of OSH (San Jose) and Home Depot (Atlanta) directed support of the program with their stores (see attachments).
- Maintained an inventory of the following: fact sheets, shelf tags, literature rack display signage, *10 Most Wanted* brochures, *Pest or Pal Activity Guide for Kids*, custom-designed product guide dispensers, and three versions of product guides (OSH, Home Depot, and generic), from which participating agencies could purchase materials.
- Updated less-toxic Product Lists: 4 versions – generic product-by-pesticide-fertilizer, generic product-by-pest, OSH product-by-pest, and Home Depot product-by-pest
- Coordinated employee trainings and tabling events at *Our Water, Our World* stores.
- Compiled information and provided outreach specific to current issues:
 - Drought and water conservation (see flyers attached)
 - Mosquito control and the Zika virus
 - Asian Citrus Psyllid and Huanglongbing (see flyer attached)
- Maintained [Our Water, Our World website](#).
- Provided [Ask-the-Expert](#) service—in which the Bio-Integral Resource Center (BIRC) provides 24-hour turnaround on answers to pest management questions. BIRC researched and provided answers to about 80 questions in FY 16-17.
- Provided and staffed exhibitor booths and made presentations to attendees (see photos attached).
 - Excel Gardens Dealer Show, Las Vegas (August 2016)
 - L&L Dealer Show, Reno (October 2016)
 - NorCal trade show, San Mateo (February 2017)

MRP Regional Supplement for Training and Outreach Annual Reporting for FY 2016-2017

- Provided on-call assistance (e.g., display set-up, training, IPM materials review) to specific stores (e.g., OSH, Home Depot)(see attachment).
- Participated in UCIPM Continuing Education for IPM Advocates.

Although effectiveness information need only be provided in the 2019 annual reports (C.9.g), below are some outputs and outcomes for FY 16-17:

- 124 *Our Water, Our World* Store Trainings¹
- 1,017 employees trained at *Our Water, Our World* stores²
- 107 Tabling events at *Our Water, Our World* stores³
- 6,577 customers contacted by Advocates at tabling events at stores⁴
- 80 questions researched and answered by technical expert
- Increases over last year in trainings by 11%, trainees by 16% and customers reached at tablings by 30%.
- Home Depot reported that Scott's Miracle Gro increased the sales of their less toxic pesticide product line Nature's Care by 49%.

C.9.e.ii.(2) Pest Control Contracting Outreach

This provision requires:

The Permittees shall conduct outreach to residents who use or contract for structural pest control and landscape professionals by (a) explaining the links between pesticide usage and water quality; and (b) providing information about IPM in structural pest management certification programs and landscape professional trainings; and (c) disseminating tips for hiring structural pest control operators and landscape professionals, such as the tips prepared by the University of California Extension IPM Program (UC-IPM).

C.9.e.ii.(3) Outreach to Pest Control Professionals

This provision requires:

The Permittees shall conduct outreach to pest control operators, urging them to promote IPM services to customers and to become IPM-certified by Ecowise Certified or a functionally-equivalent certification program. Permittees are encouraged to work with the Pesticide Applicators Professional Association; the California Association of Pest Control Advisors; DPR; county agricultural commissioners; UC-IPM; BASMAA; EcoWise Certified Program (or functionally equivalent certification program); Bio-integral Resource Center and others to promote IPM to pest control operators.

The annual reporting requirements for both sub-provisions above are the same as for provision C.9.e.ii.(1) above. Virtually all of the requirements in the two sub-provisions were addressed by the BASMAA project *IPM Focus on Multi-Unit Housing* – a pilot

^{1,2,3,4} Funded by permittees at local level.

MRP Regional Supplement for Training and Outreach Annual Reporting for FY 2016-2017

project conducted at specific locations but that produced materials that may be regionwide.

In FY 16-17, BASMAA completed the multi-year, grant-funded project *IPM Focus on Multi-Unit Housing*. BASMAA received a \$200,000 grant award from the Department of Pesticide Regulation (DPR) to conduct the project as part of DPR's Pest Management Alliance program. The primary goal of the project was to reduce pesticide use both outside and inside multi-unit housing by targeting outreach to interest-specific communities, including building owners, managers, and tenants; pest management professionals (PMPs); and architects and developers. Secondary goals included developing continuing education curricula for pest management professionals; and facilitating the public's need to identify and hire PMPs who practice integrated pest management. The project's objectives and tasks, milestones, or deliverables are listed bellow and the final report is provided as an attachment.

Objective	Tasks, Milestones, or Deliverables
1	Task 1.1. (a) Administrative and (b) initial planning meetings
1	Task 1.2. Project update meetings
1	Task 1.3. Quarterly progress reports and invoices
1	Task 1.4. Annual reports
1	Task 1.5. Presentation to PMAC (DPR Seminar)
1	Task 1.6. Final report draft
1	Task 1.7. Final report
2	Task 2.1. Develop criteria for building selection
2	Task 2.2. Develop MOU for participating buildings
2	Task 2.3. Recruit participating buildings
2	Task 2.4. Pre-project survey of participating building managers
3	Task 3.1. Develop messages for target audiences
3	Task 3.2. Produce outreach materials
3	Task 3.3. Develop and assemble IPM toolkits
3	Task 3.4. Hold IPM workshops for participating building managers
3	Task 3.5. Conduct outreach to residents
3	Task 3.6. Conduct outreach to health clinics
3	Task 3.7. Conduct inspection of participating units
3	Task 3.8. Provide IPM services
3	Task 3.9. Provide site visits of buildings by municipal staff
3	Task 3.10. Conduct outreach to architects and developers

**MRP Regional Supplement for Training and Outreach
Annual Reporting for FY 2016-2017**

Objective	Tasks, Milestones, or Deliverables
4	Task 4.1. Develop CE learning objectives for PMPs
4	Task 4.2. Develop and get approval for CE curriculum and slide show
5	Task 5.1. Update online lists of IPM-certified PMPs
5	Task 5.2. Develop outreach: "Hire IPM" materials
5	Task 5.3. Test strategies for promoting IPM services
6	Task 6.1. Develop and conduct post-project surveys of participating building managers
6	Task 6.2. Determine IPM uses and pesticide-use reduction over project term

Attachments

Mobile Cleaner Training and Recognition Program

Emergency Drought / Water Conservation Regulation Notice

Subject: California emergency drought regulations affect surface cleaners
Date: Wednesday, August 13, 2014 at 9:05:06 AM Pacific Daylight Time
From: BASMAA
To:

Having trouble viewing this email? [Click here](#)



Hello,

As a Recognized Surface Cleaner qualified by the Bay Area Stormwater Management Agencies Association (BASMAA), you need to be aware of emergency drought regulations adopted by the State Water Resources Control Board, which went into effect on July 28, 2014.

The new regulations prohibit:

- Application of potable water to any sidewalk or driveway
- Use of potable water in any way that causes runoff onto "adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures"
- Washing vehicles without a shutoff valve on a hose

These regulations will be in effect until April 25, 2015, unless canceled or extended. Agencies may assess a \$500/per day fine for violations. Exemptions will be granted "where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency."

More information is on this page:

http://waterboards.ca.gov/waterrights/water_issues/programs/drought/emergency_regulations_waterconservation.sh

The full text of the regulations is posted in English here:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2014/rs2014_0038_regs.pdf

The full text of the regulations is posted in Spanish here:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2014/rs2014_0038_spanish.pdf

If you have questions about the regulations or their applicability to your work, call the State Water Board's drought hotline: (916) 341-5342.

Thank you for your attention! We will be updating the best management practices and recognition test to include information about the drought regulations in the near future.

Best regards,

Bay Area Stormwater Management Agencies Association

Attachments

Point of Purchase Outreach

Alternative *Our Water, Our World* shelf tag



Attachments

Point of Purchase Outreach

Home Depot Letters of Support



Interoffice MEMORANDUM

DATE: January 14, 2016

TO: California Store Managers, D28 ASMs and Department Heads

FROM: Ron Jarvis

CC: Steve Knott

SUBJECT: Our Water Our World training

OUR WATER, OUR WORLD is a coalition of organizations whose purpose is to encourage consumers to use less toxic pest controls in and around their homes. They specialize in retail friendly education. Their goal is not to alienate consumers by telling them what they can't use. Their information focuses on less toxic pest management and ties into products currently on our shelves.

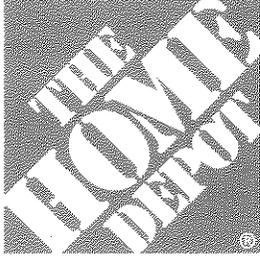
An Our Water, Our World (OWOW) representative will be in your store to help train employees and label less-toxic products with shelf-talkers. The representative may also schedule a tabling event to educate consumers. This ties in well with "How-to" weekend events. The representative will display a sampling of excellent less toxic and Eco Options products off our shelves. They will provide free informational literature and a wealth of knowledge and experience. Please enjoy this worthwhile demonstration.

A representative will contact you before the training or demonstration date to arrange details. Please contact Annie Joseph at (707) 373-9611 if you have any questions. Thank you.

Thank you
Ron

from the desk of.....

Ron Jarvis
Merchandising Vice President – Sustainability
THE HOME DEPOT USA, INC.
2455 Paces Ferry Road
Atlanta, GA 30339
(770) 384-4835
Fax (770) 384-4411



2455 Paces Ferry Road NW • Atlanta, GA 30339
770-433-8211

Store Support Center

July 28, 2017

Geoff Brosseau
Executive Director
Bay Area Storm Water Management Agencies Association
P.O. Box 2385
Menlo Park, CA 94026

Geoff,

Thank you for the support again this year of the Our Water Our World program in our Home Depot Bay Area stores. Rainfall in the area increased gardening activity, but with that rainfall came additional pest concerns, so Annie Joseph and her team of IPM Advocates have been an important resource this selling season.

Annie and team have worked closely with our associates this year to raise awareness about the Asian Citrus Psyllid potential to spread the deadly Huanlongbing disease to citrus trees, as well as two invasive species of mosquitoes that can spread Zika Virus. The Advocates have made sure our associates are well versed in these pests, as well as services offered by local agricultural departments and local Mosquito and Vector Control Agencies. Our associates then shared this valuable information with our customers.

The team's engagement, commitment, and IPM expertise continues to make them an essential partner for our Lawn & Garden business.

On behalf of The Home Depot, thank you for your partnership and support.

A handwritten signature in black ink that reads "Ron".

Ron Jarvis
Vice President Sustainability/SER

Attachments

Point of Purchase Outreach

Our Water, Our World Feature from Home Depot Annual Responsibility Report



Our Water Our World (OWOW) – California

OWOW is a collaboration of regional and local water pollution prevention agencies in Northern California.

Since 2003, Home Depot has collaborated with OWOW to raise awareness about less toxic pest management strategies and products that can help protect local waterways. Today, OWOW is active in 59 of our San Francisco Bay area and Sacramento area stores assisting customers and training associates on IPM (Integrated Pest Management) practices.

Attachments

Point of Purchase Outreach

Drought and Water Conservation Flyers



OUR WATER – OUR WORLD

Ten Tips for Water-Wise Gardening

In most of California, we enjoy a Mediterranean climate found in only 2% of the world's land mass. This climate gives us mild, wet winters and hot, dry summers. But droughts are part of our natural weather cycle, and when winter rains are minimal our water becomes even more precious. Over half of our residential water is used on landscapes, so conserving water in the garden can have a huge impact on our water supplies. You don't need to give up a beautiful, lush landscape when you create a water-wise garden. Here are some tips for creating a healthy, inviting garden requiring minimal resources and less effort and expense.

1. **Go With the Low Flow** - Use soaker hoses for irrigation, or invest in a drip system that can cut water use by as much as 90%. Consider installing a 'smart controller' for your irrigation system that can save water by helping to calculate your water requirements and adjusting to changes in water needs. Be sure to check regularly for leaks.
2. **Irrigate Early** – Watering early in the morning when temperatures are cooler and there is less wind will minimize evaporation. This also discourages pests like snails and fungal diseases like black spot that need wet foliage at night.
3. **Go Deep** – Water less often and more deeply. This encourages deeper root systems that can better tolerate dry periods.
4. **Get in the Zone** - Group plants with similar water needs together to make watering easier and more efficient. Place pots and thirsty plants near the house where you can keep an eye on them, and use native or Mediterranean plants farther away where they may need very little water once established.
5. **Mulch Like Mad** – Create a 1" to 3" layer of organic material such as bark or shredded leaves over the top of the soil and a drip irrigation system. You will be amazed at what a huge difference this makes in reducing moisture loss from soil, in moderating soil temperatures, in controlling weeds that compete for water, and in returning nutrients to the soil. Be sure to keep mulch a few inches away from the stems or trunks of plants.
6. **Count on Compost** – Add organic matter like compost to the soil to increase the soil's ability to absorb and hold water, and to slowly release nutrients to plants keeping them less stressed and susceptible to pests. If you feed plants, use a slow-release, organic fertilizer to discourage excessive plant growth that attracts pests and increases water needs.
7. **Go Native!** – You will find a wonderful variety of water-wise plants in local nurseries. Look for plants that are native to a Mediterranean climate, or for California natives that grow in dry conditions. These plants are adapted to our hot summers and usually more resistant to pests. Once established, many of these plants can survive on rainfall alone. Consider replacing declining plants with a species better suited to our climate.

8. **Fall into Planting** – When working on a large planting project, remember that the best time to plant is in the fall when the weather starts to cool. Winter rains will help these plants establish deep, healthy root systems before they have to tolerate the summer heat.
9. **Lessen the Lawn** – Lawns need a lot of water, so consider reducing or replacing your lawn with water-wise groundcovers, low-maintenance perennials or a porous hardscape. If you plant a lawn, choose drought-resistant varieties such as buffalo grass. Mow less often and raise the height of your mower blade to 3” since longer grass will shade roots, lessen evaporation, and inhibit weed growth. Your city or local water agency may offer you a cash rebate for replacing lawns and installing efficient irrigation.
10. **Get Wise to Weeds** – Keep up with weeding since weeds will compete for water. A drip system, mulch and landscape fabric will help you prevent weeds.

Additional Tips for Water-Wise Vegetable Gardening

In addition to a drip system, mulch and compost, here are some ideas for saving water when growing vegetables:

- Choose early ripening varieties and plant close together in blocks instead of rows to create shade for roots and reduce evaporation.
- Choose plants that fit your growing conditions and try heirloom varieties adapted to hot climates.
- Harvest fruits and vegetables as soon as they are ready, and pick up fallen and over-ripe fruits that may attract pests.
- Grow fewer varieties and choose vegetables that will produce a lot of food on one plant, like tomatoes, squash and peppers.

Resources

- [Our Water Our World](http://www.ourwaterourworld.org): www.ourwaterourworld.org Fact sheets with tips on healthy gardening, caring for roses, lawn care, and managing common pests.
- [UC Statewide IPM](http://www.ipm.ucdavis.edu): www.ipm.ucdavis.edu Extensive information on managing pests and diseases that may affect drought-stressed plants.
- [Plants and Landscapes for Summer-Dry Climates](#), EBMUD, 2004. A perfect resource for choosing appropriate plants and designing your garden.
- [WaterSmart Gardening](http://www.watersmartgardening.com): www.watersmartgardening.com Plant lists, visual tours of gardens, watering guides, and resources all organized by county.
- [UC Davis Arboretum All Stars](#): Great information on 100 beautiful plants recommended for California gardens.
- [Your local water district](#): Many districts provide recommended plant lists, watering guidelines, rebates for removing lawns and saving water, and water saving tips.
- [Greywater Action](http://www.greywateraction.org): www.greywateraction.org – Ideas for using water from sinks, showers and washing machines to irrigate your garden.



OUR WATER – OUR WORLD

Protecting Landscapes During a Drought

Droughts can be part of our natural weather cycles. But when drought conditions persist for long periods of time, it can significantly impact plant health in a number of ways. Lack of water limits a plant's ability to produce food, and stressed plants can release chemicals that can attract pests. Excessive heat can accelerate the reproduction time of pests. But there are a number of strategies that can help protect plants during extensive drought conditions.

How Plants React During a Drought

When a plant is stressed from lack of moisture, it closes the pores (stomata) in its leaves to reduce water loss. As a result, the plant does not absorb the carbon dioxide it needs for photosynthesis. The lack of water also limits the plants ability to move food and essential minerals around. Both these factors limit the plants ability to grow and develop, so plants may show stunted growth, chlorotic leaves, leaf drop, a thinning crown, or poor shoot growth. It may take trees and large shrubs a couple of years to recover following a severe drought.

Pests and Diseases

During fall and winter, rain can help wash insect pests like mites and aphids from plants, and cool temperatures keep pests from reproducing. But during a drought, warm temperatures can accelerate pest reproduction rates and the pests can quickly outnumber the populations of beneficial insects that prey on them.

When plants are water-stressed they produce fewer defensive compounds, which makes them more susceptible to pests. Some plants may even begin to emit chemicals, such as ethanol and alpha-pinene, which can actually attract pests like borers and bark beetles. Some insect pests, such as spider mites and whitefly, flourish in dry, dusty conditions and their populations may increase during a drought. Nutrients may be more concentrated in water-deficient plants, providing a substantial food source for these pests.

Some plant diseases, such as canker diseases, usually affect older or drought-stressed trees and shrubs. But fungal diseases that usually live on dead wood can invade living tissues when plants are moisture stressed, causing dieback in younger plants.

Drought Stressed Trees

There are many factors that impact a tree's ability to survive a drought, such as the length of the drought, the plant species, and how well the soil holds water and nutrients. Other environmental stresses may impact the plant as well, such as competing with turf for water, heat from pavement and buildings, soil compaction, and air pollutants. Symptoms of drought stress include wilting, leaf drop, chlorosis, leaf margins that turn brown, stunted new growth, browning and loss of needles on conifers, and eventually twig and branch dieback.

Drought stressed trees can attract insect pests and diseases such as borers, bark beetles and cankers. Borers are common in drought-stressed plants. As they feed on the tree's inner bark, their tunnels inhibit the movement of water and nutrients. Bark beetles are common on conifers like pines. Their tunnels can impede the plants ability to transport water and they sometimes bring in a fungus which speeds up the plant's decline.

Strategies for Protecting Plants During a Drought

- **Drought-Resistant Plants**

Choose plants adapted to having less-water and drier conditions. You may be able to get a list of recommended plants from your local University Extension Service or water district.

- **Install Efficient Irrigation Systems**

Even water-wise plants will need water to get established. Drip irrigation systems or soaker hoses for trees and shrubs can substantially cut down on water loss and be more efficient in delivering water directly to a plant. Water early in the morning when there is less wind creating evaporation, and water less often and more deeply to encourage deeper roots. In many areas, water providers offer rebates for installing efficient irrigation systems.

- **Apply Mulch**

Covering the soil with a layer of organic material like wood chips, bark, straw and leaves, can have a huge impact in the health of plants and the landscape. The mulch reduces water loss through evaporation, feeds the soil organisms, keeps weeds from germinating, and improves the soil's ability to hold moisture. Apply 2" to 4" of mulch around plants, but keep the mulch 2" to 3" away from the stem or trunk of a plant.

- **Use Organic Fertilizers**

Applying fertilizer during a drought will not necessarily encourage plant growth, because lack of water limits the plant's ability to take up nutrients and move them around in the plant. In addition, high salt fertilizers can actually injure the plant when the salts build up in dry soils. To help minimize the stress of drought and maintain soil fertility, use organic, slow release fertilizers. These will be most effective when the rainy season begins. Many organic fertilizers contain the spores of beneficial microbes, called mycorrhizal fungi. This symbiotic fungus can aid a plant during drought by helping roots access water and nutrients.

Pruning

Remove dead limbs that may be harboring insect pests or diseases. Light pruning on shrubs to permit circulation may deter insect pests like whitefly that like dry conditions. But in general, avoid significant pruning of live plant material to reduce additional stress and create wounds that attract pests.

- **Anti-Transpirants**

An anti-transpirant is a compound sprayed on foliage to provide a barrier to water loss. These products have a short-term benefit, but can be especially useful on young plants or new plantings.

- **Pest Management**

Keeping plant stress to a minimum through efficient irrigation, mulch, and slow-release fertilizers will help deter pests. Monitor plants frequently to identify and manage any problems as soon as they occur. If pest problems persist, use soaps, oils and biological controls (such as spinosad) to manage problems. Use any pesticides sparingly to reduce the impact on the beneficial insects that can help keep pest problems in check.

For More information:

Our Water Our World, www.ourwaterourworld.org

Drought and Landscape Plants, article by B. Fraedrich, Bartlett Tree Research Labs.
www.bartlett.com/resources/Drought-and-Landscape-Plants.pdf

How Does Drought Stress Influence Plant-Insect Interactions? Article by University of Illinois Extension:
<http://hyg.ipm.illinois.edu/pastpest/200516f.html>

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Attachments

Point of Purchase Outreach

Citrus Leaf Miner Flyer



OUR WATER – OUR WORLD

Citrus Leaf Miner

Citrus leaf miner has recently arrived in Northern California, but is native to Mexico. It is also in Arizona and other Citrus growing states. The small, light-colored moth lays eggs singly on the underside of the leaf. Eggs hatch and larvae start feeding immediately in shallow tunnels in the leaves, called mines. As larvae get bigger you begin to see evidence of excrement filling the mine with frass.

Citrus leaf miners are active midsummer through late fall depending on location, and can damage young trees under 4 years of age. Most mature trees tolerate leaf damage without impacting the tree growth or yield. The most damage is seen in nurseries and new plantings where leaf miners can retard new growth. Coastal lemons that have several flushes of growth can be affected throughout their life.

Monitoring for Citrus Leaf Miner:

- Watch for tunnels on leaves. The leaves may also look distorted and begin to curl.
- Pheromone traps can be set out in March through November to catch the adult males. These traps will alert you to the egg-laying activity and proper timing for pesticides if needed.
- Traps need to be placed inside the tree at shoulder height.

Cultural Controls:

- Avoid pruning live branches more than once a year to avoid cycles of flushing which attracts the pest, and don't prune during most active season.
- Do not apply fast release nitrogen fertilizers when leaf miner populations are high, as new growth will be damaged.
- Trim vigorous shoots that develop on branches above the graft union on trunks of mature trees. These produce new growth that can attract the miner.

Biological Controls:

- Green lacewing larvae, parasitic wasps and parasitoids.

Chemical Controls:

- Use oils and neem oil to suffocate eggs.
- Spinosad is also listed as a control for leaf miner, and can be somewhat effective for citrus leaf miner.

Attachments

Point of Purchase Outreach

Photos from trade shows



Presentation to attendees



Trade show booth

Attachments

Point of Purchase Outreach

Store Partnership Flyer



OUR WATER – OUR WORLD

Introducing the Home Depot and Our Water Our World Store Partnership Program

The Our Water Our World Program is a collaboration of regional and local water agencies in Northern California. This program raises awareness about the connection between pesticide use and water quality, and provides information to consumers about pest management strategies and less-toxic alternatives that can help protect water quality. These management strategies are based on IPM or integrated pest management.

Since 2003, Home Depot and Our Water Our World have partnered to reduce toxic runoff from fertilizers and pesticides into local waterways. This continued partnership is intended to reduce the amount of pesticides entering creeks and the Bay through local sewers and storm drain systems. The program will increase your store's visibility as an environmentally friendly business while maintaining or increasing sales of pest management products.

We look forward to working with you!

What is IPM?

Integrated pest management is a common-sense strategy for managing pests that uses a variety of practices while minimizing risks to people and the environment. IPM does not mean completely avoiding pesticides—but it does emphasize identifying the pest, understanding its life cycle, and starting with the least-toxic practices first.

Here are some of the practices used in IPM:

Monitoring

Using traps to pests and diseases to catch any problems early.

Biological Control

Encouraging beneficial organisms, such as lady beetles, lacewings, and nematodes, to help manage pests.

Cultural Control

Choosing the right variety of plant for the right place and using disease-resistant varieties. Fertilizing with slow-release, organic fertilizers will keep plants healthy and more resistant to pests and diseases.

Physical Control

Keeping pests out without chemicals by using barriers and traps, such as copper barriers for snails, caulk in crevices where ants enter structures, sticky barriers for whiteflies, and traps for yellowjackets.

Chemical Control

Using pesticides only when needed, choosing the least-toxic product first, and using a pesticide appropriate for the specific pest.

Tips For Working With Customers

- Less-toxic products may take longer to work than traditional pesticides.
- Timing of application is important since many less-toxic products break down faster. To be successful, you need to understand the target pest and when applying a pesticide would be most effective.
- Most less-toxic products are not broad spectrum, so beneficial insects are less at risk.
- Remember to spot treat – it is not always necessary to spray the whole plant.
- Apply soaps and oils early morning or late afternoon to avoid burning plants. Soaps are less effective in hard water because the minerals impact the fatty acids that are used to manage pests.
- If releasing beneficial insects, give them time to manage the pests, and don't use pesticides since they will damage the beneficial populations.

Elements of the OWOW Program

Shelf Talkers

Shelf talkers are placed underneath products to identify less-toxic choices and organic soils & amendments.

Fact Sheet Rack

There are 15 different fact sheets available to your customers with information on strategies for managing common pests and protecting water quality.

Staff Training

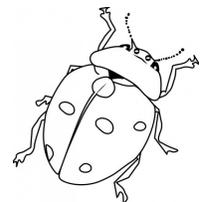
We can schedule a training for your staff with information on answering customer questions and tips for using/selling products.

Customer Outreach

We can staff a table with samples of less-toxic products and answer your customers' questions on pest management, how to keep soil healthy and water-wise plant choices.

End Caps

Working in conjunction with your vendors, we can help set up and label end caps highlighting organic and less-toxic products.



Attachments

Pest Control Contracting Outreach & Outreach to Pest Control Professionals

Final Report: IPM Focus on Multi-Unit Housing

THE HEALTHY BUILDINGS PILOT PROGRAM

IPM Focus on Multi-Unit Housing

A Pest Management Alliance Grant Project

Funded by the California Department of Pesticide Regulation

2014–2017

Final Project Report

Submitted by the Bay Area Stormwater Management Agencies Association

May 2017

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EXECUTIVE SUMMARY AND RECOMMENDATIONS FOR FUTURE PROJECTS

The Bay Area Stormwater Management Agencies Association (BASMAA), a consortium of permitted municipal stormwater protection agencies in the nine San Francisco Bay Area counties, has a long history of effective promotion of integrated pest management (IPM), including the well-established Our Water Our World point-of-sale education program in local garden centers and hardware stores. Persistent challenges for stormwater permittees include reducing perimeter spraying with pyrethroids or fipronil to kill ants, as water quality studies show pesticides in the receiving waters of storm drainage systems; effecting behavior change among managers and residents of multi-unit residential buildings; and effective message delivery to individuals and companies that hire pest management companies.

Participating cities adopted the name “Healthy Buildings Pilot Program” for the project, as it was designed to address those stormwater pollution prevention challenges by combining *water quality messages* associated with outdoor use of pesticides with *public health messages* associated with indoor use of pesticides. Combining messages and targeting building owners, managers, residents, and pest management professionals (PMPs) led us to the elements of the project, which include

- Outreach to multi-unit building managers and residents about IPM and this pilot project
- Provision of IPM services to diverse pilot sites in least three municipalities for one year, with pre-and post-project surveys intended to demonstrate program effectiveness and point out areas for future improvement
- Additional outreach to neighborhood clinics and health centers, focusing on the causal relationship between pest infestations and asthma
- Outreach to property developers and architects based on San Francisco’s *Pest Prevention By Design Guidelines* (<https://sfenvironment.org/download/pest-prevention-by-design-guidelines>)
- Development of a continuing education training module for PMPs focused on IPM in multi-unit housing, for approval by the California Structural Pest Control Board
- Efforts to improve awareness of IPM certification programs for PMPs

The ambitious scope of the pilot project was made possible by the generosity of participating cities, University of California Cooperative Extension, and the Department of Pesticide Regulation—all of whom donated many staff hours to project planning, execution, and analysis. BASMAA is deeply grateful to these agencies and their staff members for their enthusiasm and dedication to this collaborative effort. Equally important, representatives of Pestec, the project’s IPM provider, were full partners in every aspect of the project. We all benefited from Pestec’s willingness to share their expertise and experience, and their commitment to the project and its goals.

Pestec’s and municipal staff’s work with participating buildings was the heart of the program. All or portions of 11 buildings in five cities participated, bringing a total of 101 residential units into the program. See Table 1 for a breakdown of ownership, management, and resident types.

In spite of a stream of foreseeable and unforeseeable problems along the way, building managers and tenants reported that IPM approaches effectively eliminated or vastly reduced pest sightings in most units in most buildings.

While managers and residents were receptive to the training workshops and materials we provided, exit interviews with owners and managers made clear that Pestec staff's friendly persistence and familiar presence over the course of the project were major factors in convincing residents to hold up their end of the bargain—implementing good housekeeping practices and informing building management if pests were found. See the building-by-building summary in Appendix 11 for details.

Recommendations for follow-on projects

The pilot project was a learning experience for all involved. As challenges arose, our understanding of the complex set of target audiences grew. We gained insight into how we might have planned and implemented the project to be more effective in reaching buildings with more severe pest management problems than the buildings that participated in the pilot.

New project objective: Develop and implement IPM approaches that will be successful in the most challenging settings. This will require a significant commitment to the project by participating municipalities and staff.

Focus on buildings with severe pest problems

- Thoroughly brief code enforcement and building inspection departments at the outset of the program, and agree on a local strategy for dealing with code violations and tenant complaints
- Develop a local strategy, based on state laws and local ordinances, for resolving bed bug problems when found
- Funding: Consider expanding the program by incorporating a city match for DPR funding. Budget realistically for 1) potential provision of pest exclusion repairs early in the program, and 2) accommodation of more buildings, as pest complaints diminish after a few months; as well as 3) city-sponsored (free to building owners and residents) cleanup days offered to all buildings early in the program
- Project proponents may need to make clear to budget decision-makers that this program is an important element of stormwater pollution prevention

Improve program participation (building identification and recruitment)

- At the outset of the program, increase educational effort for building owners, i.e., spend more time and effort recruiting buildings.
- Include training on *Pest Prevention by Design Guidelines*, incorporating materials developed by the City and County of San Francisco (see section 3c, below)
- Educate building owners about their responsibility under California law and local ordinances (this may fall to code enforcement or housing department staff in large municipalities)
- Involve owners and managers of pilot project buildings in promoting an expanded project

Anticipate challenges that work against a collaborative relationship between residents and building owners or management

- Language issues

- Fear of deportation following “exposure” to city government
- Illegal crowding related to the high cost of housing in the Bay Area

PILOT PROJECT OBJECTIVES

1. Project administration and management

The strength and dedication of the project team was consistent throughout the project. The team deserves all credit for the program’s success. Members of the team:

- Nita Davidson, DPR Grant Manager
- Geoff Brosseau, Principal Investigator
- Janet Cox, Project Manager for BASMAA
- Amanda Booth, City of San Pablo
- Michelle Daher, City of East Palo Alto
- Maree Doden, City of Palo Alto
- Samantha Engelage, City of Palo Alto
- Sraddha Mehta, San Francisco Department of the Environment
- Chris Geiger, San Francisco Department of the Environment
- Amber Schat, City of San José
- Andrew M. Sutherland, University of California Cooperative Extension Urban IPM Advisor
- William Quarles, Bio-Integral Resource Center
- Tara Cahn, Tara Cahn Architect
- Luis Agurto, Jr., Pestec
- Mikail Price, Pestec
- Lauren Wohl-Sanchez, Lauren Wohl Designs

Results

With submission of this report, we have met all reporting deliverable requirements. The project came in on budget largely because reduced pest infestations in participating buildings freed up resources.

We’re grateful to Andrew Sutherland for allowing us to use a web portal administered by the University of California Division of Agriculture and Natural Resources. We used the portal to store meeting notes and memorialize communication among members of the project team, and to post documents and resources. Access to the portal is available through Nita Davidson at the Department of Pesticide Regulation, at her discretion. Key messages and resources, including appendices to this report, are available on the project webpage on the BASMAA site.

Lessons learned

Perhaps because of the size of the project team or because many key participants were volunteering their time, BASMAA’s Project Manager and the Principal Investigator spent more time than was initially budgeted coordinating the various tasks and finalizing deliverables. In a subsequent project we would try both to budget more accurately and to plan to reduce the need for so much coordination, so that more resources will be available for delivery of pest management services.

Appendix 1: Pest Management Alliance application

Appendix 2: Quarterly and annual project reports

Appendix 3: Presentation to Pest Management Advisory Committee, November 10, 2016

2. Pilot the project in at least three municipalities

- After consultation with BASMAA member agencies, five Bay Area cities agreed to participate. City staff identified candidate buildings and their landlords, and sent recruitment letters on city letterhead. Letters attached hard copy applications and surveys, and (alternatively) linked to an online Google form. We budgeted to provide services to a total of 150 units in up to 15 buildings.
- Recruiting buildings to participate in the program, however, was much more difficult than we expected. Project team members thought a year of free pest management services would be a tremendous draw. This alone was not sufficient to attract enough participation. We identified several factors that prevented building owners from joining, including:
 - City staff were building owners' primary points of contact for the program; invitations to apply and participate went out on city letterhead. Project team members felt this was necessary in order to convey official approval of the program, but it likely signaled to owners that the program was regulatory (as well as advisory and free). A fact sheet about the program was included in the mailing.
 - In most cases, buildings proposed by owners were not heavily infested with pests. The exception was the buildings in East Palo Alto, which were flagged by the city, and whose owners understood that successful implementation of the program might help with ongoing issues with the city.
 - It may be the case, unfortunately for residents, that some owners of buildings with severe pest problems are simply not interested in resolving—or bringing attention to—those problems.

Results

The program included 101 units in 11 buildings in 5 municipalities. See Table 1.

Lessons learned

The approach most cities took to identifying candidate buildings—using a letter from the city to solicit known building owners with a letter from the city—was adequate, considering the budget and timeframe of the pilot project. Expanded projects post-pilot, however, will benefit from more labor-intensive recruitment strategies that stress landlords' legal responsibility to tenants and possibly involve building inspector and code enforcement departments.

The project team considered, and rejected, the idea of binding participating owners with memoranda of understanding with their respective municipalities. In most cases this was the correct decision. We surmise, however, that for landlords whose hearts aren't likely to be in the program, or in future projects where code enforcement is involved, MOUs might help secure cooperation from owners (such as inducing them to cancel ongoing scheduled spray contracts with providers of conventional pest management, for the duration of the IPM project).

Table 1: Participating buildings

City	Building	Type	Year built	Ownership	Management	No. units	Language(s)
East Palo Alto	EPA-1	Rent control	n/a	Private	Off-site	2	Spanish
East Palo Alto	EPA-2	Rent control	n/a	Private	Off-site	17	Spanish
Palo Alto	PA-1	Low income/ mkt rate	1953	Private	Off-site (by owner)	13	English/ Vietnamese
San Francisco	SF-1	Low income/ affordable	1909	Non-profit	Off-site	24	Chinese
San Francisco	SF-2	Low income/ affordable	n/a	Non-profit	Off-site	14	Chinese
San José	SJ-1	Market rate rental	1963	Private	Resident manager (first half of program)	4	Spanish, Vietnamese
San José	SJ-2	Market rate rental	1964	Private	On-site mgmt. office	4	Spanish
San José	SJ-3	Low income/ affordable/ market rate rental	1964	Private	On-site mgmt. office	5	Spanish
San Pablo	SP-1	Market rate rental	1968	Private	Off-site (by owner)	6	Spanish/ English
San Pablo	SP-2	Market rate rental	1968	Private	Off-site (by owner)	6	Spanish/ English
San Pablo	SP-3	Market rate rental	1968	Private	Off-site (by owner)	6	Spanish/ English
Total units						101	

Appendix 4: Sample recruitment letter and application and pre-project survey

Appendix 5: Program fact sheet

Note that one of the deliverables for this objective, the list of participating buildings, is on the password-protected UC ANR website but not included on the public website.

3. Reduce use of pyrethroids and fipronil by promoting IPM in multi-unit buildings

3a. Outreach to managers and residents

Project team members met to develop messages for building residents (our target audience), which we referred to consistently as we developed outreach materials.

After some deliberation by the project team, we decided to offer an introductory workshop, with food provided by the municipality, at each building site. We prepared the following materials for each event:

- Scripted slide presentation introducing the program, basic IPM approaches to managing common pests, and the importance of good collaboration between residents and management. Presentations were tailored to each city's participating buildings and prepared in English and Spanish. San Francisco used the English version with a City staff member translating and taking questions in Chinese.
- Sets of nine pest identification and prevention cards ("Pest cards"), tailored to the program, in English, Spanish, and Chinese
- "IPM Toolkits"—buckets containing cleaning materials, caulk, and other items (one kit for each building, to be borrowed by residents)
- A vacuum cleaner with HEPA filter for each building, to be borrowed by residents
- Cleaning cloths for each attending resident

Results

Events were well received and relatively well attended with the exception of San Pablo, where the owner-managers came but no residents were present. Luis Agurto, Jr. of Pestec took questions in Spanish when appropriate, and that worked well. In San Francisco, a bilingual San Francisco staff person translated into Mandarin for the many residents who joined us. The general atmosphere at these events was cordial and predictive of the good relations throughout the program term among city liaisons, Pestec, residents, and managers.

Lessons learned

Residents were mainly concerned about cockroaches. They were interested in hearing about and discussing family health issues associated with cockroaches in the home.

Serving food and having small gifts for residents in attendance may make the program seem less regulatory—which is probably helpful for residents, but perhaps not optimal for all owners and managers. In East Palo Alto, residents were eager to complain about the owners (who were present) and their unresponsiveness to complaints and willingness to let the buildings decay. City staff were paying close attention.

Appendix 6: Messages for target audiences

Appendix 7: Informational pest cards for building residents

Appendix 8: Contents of IPM toolkits distributed to building managers

Appendix 9: IPM Workshop slide presentation in English and Spanish

3b. Provision of IPM services to participating buildings for one year

Kickoff events were followed by Pestec’s initial inspection visits to each building. Subsequently Pestec technicians visited buildings on a regular, noticed schedule.

Pestec technicians produced two automated reports for each building: a photographic record of pest-conducive conditions (“Fieldwire” reports), and a detailed, automated recording of conditions, prescribed treatments, and pest management products used (“PestPac” reports). Both of these reports are formatted and generated by proprietary subscription services. The PestPac report, which includes more detailed information, is long and challenging to understand by the unfamiliar reader, so we went to some lengths to translate it for building managers.

As part of their regular service under the program, Pestec developed a detailed summary report, “Initial Findings and IPM Treatment Plan” for each building. These reports include an introduction to the Healthy Homes Program, a detailed report of pest sightings at the initial visit, a description of the prospective roles of building management, residents, municipal staff, and Pestec over the course of the pilot, a summary of Pestec’s plans to treat pests on the premises (including pest management products), and the service schedule for that building.

Pestec provided a binder (log book) for each building, which included the IPM plan, the automated reports, and additional materials including reporting forms for tenant use; program materials; and a cheat sheet designed to aid in reading the PestPac reports.

It was important to ensure that building owners and managers received and understood the reports, were aware of pest exclusion repairs that needed to be done, and were committed to maintaining communication with residents so that Pestec management could alert Pestec if pests were cited on the premises. We tried several strategies to encourage cooperation:

- Pest Cards provided to residents stressed the importance of reporting pest sightings to management (who would then call Pestec)—promptly and instead of trying to deal with pests on their own, for the duration of the program
- We worked together with cities and Pestec to design an alternative form that city staff could use to translate the PestPac reports for managers. Municipal partners translated the form into Spanish and Portuguese, the languages requested by cities that wanted to use the form.

The program rep from the City of San José worked with numerous city departments, building management, and Pestec to plan and fund a “Fall Cleanup Day” at two buildings that are part of a larger complex of multi-unit buildings. The City provided Dumpsters and bulky-item pickup, and Pestec and residents provided muscle. This was a very successful event. Residents of nearby buildings asked if they could contribute to the collection, and we were happy to accommodate them.

Results

As the pilot progressed, two facts became clear. First, pest sightings became rare in buildings where owners and managers provided the best cooperation with Pestec. In these buildings, Pestec reduced their schedule of visits to quarterly from monthly. Second, in buildings where owners and managers were slow to execute recommended pest exclusion repairs, pest sightings continued. Because fewer visits to buildings in the first category saved project money, the project team decided to pay Pestec to provide pest exclusion repair services at buildings in the

second group. As a result, by the end of the pilot, pest sightings were essentially eliminated in almost all units.

In spite of the program's general success, many problems emerged in different buildings—all of which are informative for future projects.

- In one building the manager did not have keys to units, and never obtained keys during the pilot. This meant that Pestec had to make repeated visits to notify residents of scheduled visits and provide service, or try to find times to show up when residents would be at home.
- One participating building changed hands partway through the pilot year. Residents were given 90 days to move. Thanks to efforts of municipal staff, the new owners decided to stay in the program and discussed their remodeling plans with Pestec soon after taking possession. The owners, and new tenants, speak Vietnamese—which was not one of our languages for translation at the beginning of the pilot. Subsequently, we added Vietnamese translations to our deliverables.
- In the course of the sale, termites were found. Termites and treatment for termites were not a part of the program agreement with Pestec. The City provided the owner with termite IPM treatment information and notice that using conventional pest treatments to deal with termites might mean that results from that building would be excluded from the project. This turned out not to be an issue for the program, as the new owner has to date not addressed the termite problem.
- Hoarders in two buildings forbade access to their units to management and to Pestec. In these cases, Pestec worked to seal off the hoarders' units from contiguous units. This was successful in keeping pests from migrating to neighbors' homes, but severe pest problems in the hoarders' units remained.
- In one case the building owner failed to cancel a previous contract with a conventional pest control company, and spraying was going on inside the building, with bug bombs (total release foggers) placed in units, when Pestec and the municipal rep arrived for a regular program visit. *Spraying and using foggers inside without giving tenants notice is illegal.* The owner subsequently denied that this had happened.
- In the same complex, building residents complained to management about sanitation in the Dumpster area and other pest-conducive conditions, but management did not act to remediate identified problems. Residents refused to allow the owner into units and threatened violence when the owner accompanied the Pestec technician.
- Owners of the complex offered payment to a Pestec technician in exchange for a favorable report at the end of the program.

Lessons learned

A key lesson from this project is that it is most difficult to get buildings with the worst pest problems to sign up for a voluntary program with significant “free stuff”...for obvious reasons including owners' reluctance to spend money on maintenance, possible apathy about problems afflicting tenants, and fear that a city-sponsored program will “out” them to building inspectors or code enforcement. In fact, the building with the most severe problems in the pilot was urged by local Code Enforcement to participate, as the City was already trying to deal with recognized issues. For the most bang for the project investment buck, participating cities in future programs

may want to select buildings with known, severe pest problems, and involve code enforcement in developing incentives for participation.

It may be most effective for future programs to budget for some baseline set of relatively simple pest exclusion repairs at the outset of the program. This will promote good relations among the city, building owners and managers, and the pest control company, and that in turn will reduce future costs and allow more buildings into a program.

In our efforts to provide clarity and consistency and to facilitate good collaboration and coordination between building owners and managers and Pestec, we developed a lot of documentation that was not used consistently. In fact it was the people skills of Pestec technicians (and consistent assignment of technicians to buildings for the duration of the program) that made the program work for building staff and residents.

The Fall Cleanup Day and bulk pickup day organized and facilitated by San José staff was very successful, both in demonstrating to residents the City's and Pestec's eagerness to help and in allowing Pestec to find and address pest problems (e.g., moving a refrigerator to find and eliminate a cockroach nest and caulking spots they had not seen before). It would have been helpful to have held such events in other cities, and at the beginning of the program rather than at the end.

Appendix 10: Example IPM plan prepared by Pestec

Appendix 11: Building reports and evaluation summaries

Appendix 12: Example log book

Appendix 13: Representative PestPac reports

Appendix 14: PestPac explainer

Appendix 15: Representative Fieldwire reports

Appendix 16: Alternative tenant report template

3c. Outreach to architects and developers

In 2012 the City and County of San Francisco published *Pest Prevention by Design Guidelines* (PPBD), a comprehensive reference on designing and retrofitting buildings to exclude pests. The two-year, national consultative process of developing the Guidelines was funded by the U. S. Centers for Disease Control with participation from grant manager Nita Davidson of DPR. The intended audiences for PPBD are architects, engineers, builders, and the green building community.

San Francisco, a key member of our project team, has continued to support PPBD and related outreach, with programs and presentations designed for local developers and the non-profit organizations that have assumed management responsibilities for management and maintenance of the City's public housing stock.

In addition, Tara Cahn, a local architect who was also on the PPBD development panel, presented on PPBD to the Non-Profit Housing Association of Northern California's Emerging Leaders Peer Network, a membership group, in Oakland. The diverse audience included developers and architects.

Results

As noted above, over the past few years San Francisco has transferred ownership and management of all of its public housing stock to non-profit property management companies. (See <http://www.politico.com/magazine/story/2017/07/20/how-san-francisco-turned-its-tenements-into-treasures-215391>) Because the City and County retains ownership of the land, it can put certain conditions on management, including incorporation of PPBD principles in renovation and retrofit plans, and pest management using IPM practices. San Francisco Department of the Environment staff continue to educate building owners and management on the importance of building design for pest exclusion.

Lessons learned

While San Francisco has maintained significant control over the entities that are now responsible for their low-income housing stock, all cities could surely benefit from bringing local owners and developers together for education based on PPBD. This could be incorporated into program recruitment outreach.

Appendix 17: Pest Prevention by Design Guidelines

Appendix 18: San Francisco outreach materials

Appendix 19: Tara Cahn's presentation to the Non-Profit Housing Association of Northern California's Emerging Leaders Peer Network

3d. Outreach to local health centers and their clients

Michelle Daher, project team rep from East Palo Alto, asked Luisa Buada, CEO of the Ravenswood Family Health Center, to join the project team for a discussion of health problems related to pests and pesticide use that her clients bring to the clinic. The subsequent conversation with others on the team was helpful and enlightening. The team subsequently prepared an outreach piece focused on health problems caused by cockroaches, and IPM approaches to cockroach management.

Characteristics of the audience:

- 3rd-grade reading level (40 percent of Ravenswood Family Health Center clients are functionally illiterate in their primary language)
- High asthma rate and lack of understanding about causes
- Cockroach problems are often so severe that parents spray beds where children sleep
- Patients lack insurance
- Clientele includes
 - Undocumented people and people who live in severely overcrowded homes where pest problems can proliferate
 - Homeless people
 - Landscape workers (need messages about separating work clothes from other laundry)
 - Landlords (opportunity for messages about trash area cleanliness)

Results

We printed as many cockroach fliers as the program budget would allow, in English, Spanish, Chinese, Vietnamese, and Tongan, and provided them to our municipal partners for distribution in health clinics and community centers.

Lessons learned

Health centers are good venues for key messages about indoor IPM.

Materials need to be nonthreatening with content conveyed by images rather than words to the greatest extent possible.

Cockroaches are the pest to concentrate on. (Head lice and scabies are other common pest problems with these audiences.)

In a future program, it would make sense to focus early on health centers, as people with asthma and parents of small children are eager for information from their health care providers.

It is more effective to provide educational materials to physicians and nurse practitioners to distribute, rather than making them available in waiting areas.

If budget had permitted, we would have produced simple, image-dominated posters for exam rooms and waiting areas.

Appendix 20: Outreach piece for health clinics, featuring IPM strategies for managing cockroaches

4. Develop a training module for continuing education credits for pest management professionals, focus on IPM strategies for multi-unit housing

This portion of the project was led by Andrew Sutherland, UC IPM Program, and Nita Davidson of DPR. Collaborators included Pestec staff, William Quarles of BIRC, Tara Cahn, and Geoff Brosseau and Janet Cox, principal investigator and project manager, respectively.

Results

The course has been approved by the Structural Pest Control Board, completing the deliverable specified in BASMAA's contract with DPR.

At this writing, Andrew Sutherland is completing a Powerpoint presentation and script that will be adapted for an online one-hour course to be housed on the UC IPM website (as well as other entities' sites, at their option). In the meantime, Pestec has developed a Prezi that Luis Agurto has presented successfully to the Pesticide Applicators' Professional Association.

Lessons learned

This portion of the project probably would have been completed faster if we had budgeted more for it! We were fortunate that both Andrew Sutherland and Nita Davidson justified work on this as part of their professional workplans.

Many pest control companies that offer IPM services also offer conventional (spray schedule) services—so customers need to insist on IPM. The course needs to provide a strong business case for providing IPM services, and suggest marketing approaches companies can use to help customers distinguish the long-term benefits of IPM over conventional methods.

One challenge for an online course will be that different municipalities may have local ordinances that affect both multi-unit building owners' responsibilities re: pest management, and pest management professionals' (PMPs') reporting requirements. It would be helpful to develop a course appendix that summarized these, in addition to state laws enacted in the past few years.

The team architect, Tara Cahn, raised issues about the appropriateness of pest control companies performing structural repairs for the purpose of excluding pests. We resolved the question based on Pestec's experience and consideration of licensing guidelines for PMPs, with the following:

- The course will distinguish between repair and renovation services that can be provided by licensed PMPs and those that can't; and include information to educate PMPs about additional training and licenses that may be helpful to them.
- The course will present the key laws and regulations that allow or prevent PMPs from providing these services.
- During discussion of the business aspects of IPM services, we will describe conditions that make a building, or a client, a good fit for IPM.

Appendix 21: CE module presentation

Appendix 22: Prezi developed by Pestec

5. Increase Demand for IPM services among those who hire pest management services

This portion of our project included two activities: (1) clarifying web listings of IPM-certified PMPs, and (2) preparing outreach materials for people hiring pest management services.

Results

The Bio-Integral Resource Center (BIRC), which maintains and supports the California-based EcoWise Certified Program, reorganized and updated its list of certified companies and PMPs. The revised list is posted on the BIRC web site (www.birc.org) and EcoWise Certified site (www.ecowisecertified.org). Certified companies are now listed on the front page, and certified practitioners, with names and contact information for the companies they work for, are on a secondary page. We believe this gives people looking for IPM services excellent tools to find them.

EcoWise Certified is one of three IPM-certification programs. Green Shield Certified, based in Madison, Wisconsin, certifies only three companies in California. In contrast, GreenPro, a program established by the National Pest Management Association of Fairfax, Virginia, certifies more companies in California than EcoWise, but has less stringent requirements.

The Our Water Our World program has recently updated and redesigned its set of IPM fact sheets, which are available in hardware stores and nurseries in many California cities. The project team decided that an updated "Buy IPM" fact sheet was needed, so the project provided one.

Appendix 23: OWOW Buy IPM fact sheet